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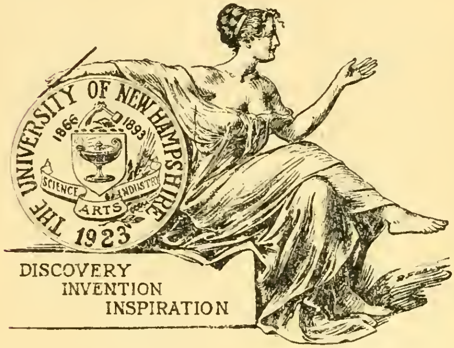

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Bulletin 179 **September, 1916**

NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF CHEMISTRY

Analysis of Fertilizers

FOR 1916

MADE FOR THE
STATE DEPARTMENT OF AGRICULTURE

1866 1893

BY B. E. CURRY AND T. O. SMITH

New Hampshire College
of
Agriculture and the Mechanic Arts
Durham, N. H.

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NEW HAMPSHIRE COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION, DURHAM, N. H.

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SEED TESTS.

Made September 1, 1915, to September 1, 1916.

The provisions of the Pure Seed Law enacted by the General Court in 1909, require the publication annually of a bulletin showing the results of all seed tests made officially during the previous year. The administration of this law is in the hands of the State Commissioner of Agriculture, who has appointed the writer, Agronomist of the Experiment Station, as his regular agent for making all tests and analyses in this state.

During the year ending September 1, 1916, eighty-four samples of seed were vountarily sent in for analysis. An authorized representative of the department collected an additional eighty-four, making a total of 168 samples submitted for analysis during the year.

The samples sent in by the official collector were secured from twenty-three dealers in twenty different towns, representing each of the ten counties of the state. These samples included 2 of alfalfa, 4 of alsike clover, 8 of red clover, 3 of mammoth clover, 2 of white clover, 2 of barley, 7 of corn, 11 of millet, 4 of oats, 10 of redtop, 25 of timothy and 6 of miscellaneous seeds.

The samples sent in voluntarily were from seed dealers, farmers and county agents. Since we have no knowledge that these samples represented seeds which were being offered for sale, but were simply sent in for a report which might be used as a basis of purchase, we considered the results of private rather than of public interest and hence have not published them.

In the testing and analyzing of seeds, just as in the chemical analysis of fertilizers, there are certain factors which make exact duplication of results impossible. There are always slight variations in drawing a sample of seed, in sampling the sample, in weighing small fractional parts of it, in the counting and identification of numerous seeds, etc.; there may be also fluctuations in the temperature and humidity of the germinating chamber which may affect the percentage of germination. Methods of analysis may also vary somewhat. For these reasons a slight variation from the guarantee or standard, or from a previous analysis, should not be considered of consequence.

In publishing the results of this year's official samples we have made use of a table of "tolerance of variation" for purity which has been prepared by one of the leading seed laboratories of the country, and which seems to afford a very satisfactory method of allowing or tolerating a reasonable variation in purity tests. The percentage variation for any given sample is determined by the following formula:

$$T = \frac{2(.1 + 100 - P)}{10}$$

in which "T" is the variation tolerated and "P" is the percentage of purity found. This formula applies only to seed having a purity of 50% or greater.

After applying the variations found by the above formula to the results of our tests we have simply used the following terms instead of stating the actual figures in the tabulations:

"Satisfactory," meaning that the difference between our test and the guarantee is within the variation allowed; "Above," meaning that our test, after allowing for the variation, is above the guarantee; "Below," meaning that our test, after allowing for the variation, is below the guarantee.

In the matter of germination a variation of 5% has been allowed in the statement of results and the same terms used as described above for purity.

The writer desires to acknowledge his appreciation of the careful and efficient work of Mr. Herbert R. Runnals, who assisted in making the tests and examinations of the samples herewith reported.

SEED EXAMINATION, 1916.

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
799	Barley (*4,507*) C. L. Jenness, Dover, N. H., June 22, 1916. Oats, 210; Wheat, 30; Smartweeds, 225; Yellow Fox tail, 15; Buckwheat, 75.	S	98.0	A	90.0
800	Japanese Buckwheat C. L. Jenness, Dover, N. H., June 22, 1916.	99.7	.....	97.5	.....
801	Japanese Millet C. L. Jenness, Dover, N. H., June 22, 1916. Barnyard Grass, 180; Green Fox-tail, 810; Wild Sunflower, 90; unknown, 900.	S	98.0	91.0	.....
802	Red Top C. L. Jenness, Dover, N. H., July 29, 1916. Yarrow, 69,750; unknown, 3,150.	A	90.0	S	90.0
803	Canada Field Peas C. L. Jenness, Dover, N. H., June 22, 1916.	99.8	.....	92.5	.....
804	Oats (*Welcome*) C. L. Jenness, Dover, N. H., June 22, 1916. Black Mustard, 15; Wheat, 105; Barley, 135; Vetch, 30; Black Bindweed, 45; Corn Cockle, 15.	98.4	.....	93.0	.....
805	White Clover (*88,603*) C. L. Jenness, Dover, N. H., June 22, 1916. Alsike Clover, 95,900; Catchfly, 450; Catnip, 225; Docks, 1,800; Lamb's Quarters, 5,400; Old Witchgrass, 1,575; Large Plantain, 900; Bull Thistle, 2,025; Pepper Grass, 450; Red Clover, 17,325; Rib-grass, 675; Rugel's Plantain, 1,125; Sorrel, 3,150; Timothy, 97,500; Yellow Trefoil, 1,350; Button Clover, 9,225; unknown, 9,225.	S	61.0	A	76.0
806	Hungarian C. L. Jenness, Dover, N. H., June 22, 1916. Barnyard Grass, 360; Lady's Thumb, 270; Old Witchgrass, 180; Smartweeds, 2,430; Yellow Foxtail, 360.	S	98.0	B	89.5
807	Red Clover (*C 70,157*) C. L. Jenness, Dover, N. H., June 22, 1916. Canada Thistle, 90; Burr Clover, 90; Rib-grass, 810; Wild Carrot, 450; Button Clover, 450.	A	98.0	S	92.0
808	Kentucky Blue Grass C. L. Jenness, Dover, N. H., July 29, 1916. Pepper-grass, 450; Red Top, 40,000; Smartweeds, 2,700; unknown, 5,400.	A	78.5	S	75.0
809	Timothy (*Pine Tree*) C. L. Jenness, Dover, N. H., June 22, 1916. Red Top, 450.	S	99.5	B	95.0
810	Alsike Clover (*Ace*) J. H. Griffin, Newmarket, N. H., June 7, 1916. Bull Thistle, 225; Catch-fly, 1,125; Docks, 1,350; Mayweed, 450; Red Clover, 450; Sorrel, 4,500; Timothy, 6,975; White Clover, 20,250; Button Clover, 2,925.	S	95.0	93.5	.....
811	Red Top (*Ace*) J. H. Griffin, Newmarket, N. H., July 29, 1916. Chickweed, 3,600; Cinquefoil, 11,700; Rugel's Plantain, 1,800; Timothy, 5,400; Yarrow, 37,800; Juncus, sp., 20,250; unknown, 13,500.	A	90.0	S	90.0
812	Timothy (*Pine Tree*) J. H. Griffin, Newmarket, N. H., June 7, 1916. Pepper-grass, 225; Red Clover, 225; Red Top, 675.	S	99.5	92.5	.....
813	Japanese Millet J. H. Griffin, Newmarket, N. H., May 31, 1916. Barnyard Grass, 90; Yellow Foxtail, 2,340; unknown, 360.	S	98.0	90.0	.....
814	Timothy (*6,820*) J. H. Griffin, Newmarket, N. H., May 31, 1916. Cinquefoil, 3,600; Crab-grass, 225; Kentucky Blue Grass, 2,250; Pepper-grass, 1,575; Red Clover, 225; Red Top, 11,250; Rugel's Plantain, 1,125; Sorrel, 1,125; unknown, 675.	S	98.0	84.0	.....

S—Satisfactory.

SEED EXAMINATION, 1916.—*Continued.*

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
815	Mammoth Clover (*Ace Brand*) J. H. Griffin, Newmarket, N. H., June 7, 1916. Alsike Clover, 1,620; Black Mustard, 180; Canada Thistle, 180; Docks, 810; Lamb's Quarters, 180; Cheat, 90; Rib-grass, 180; Smartweeds, 90; Sorrel, 2,070; Timothy, 450; Yellow Foxtail, 90.	S	98.0	94.5	.....
816	Red Top (*Fancy*) E. T. Wilson, Farmington, N. H., July 29, 1916. Cinquefoil, 900; Yarrow, 63,000; Juncus sp., 4,500.	B	92.0	S	90.0
817	Timothy (*White Mountain*) E. T. Wilson, Farmington, N. H., June 22, 1916. Alsike Clover, 225; Kentucky Blue Grass, 1,125; Pepper-grass, 225; White Clover, 225.	S	99.7	S	97.0
818	Timothy (*Pine Tree*) E. T. Wilson, Farmington, N. H., June 22, 1916. Alsike Clover, 675; Kentucky Blue Grass, 450; Pepper-grass, 225; Red Top, 225; Juncus sp., 1,350.	S	99.5	S	95.0
819	Oats (*White Mountain*) E. T. Wilson, Farmington, N. H., June 22, 1916. Wheat, 15; Barley, 15; unknown, 30.	A	99.0	S	95.0
820	Alsike Clover (*Eureka*) E. C. Foss Co., Rochester, N. H., June 20, 1916. Red Clover, 360; Sorrel, 540; Timothy, 450; White Clover, 1,350; Juncus sp., 360.	A	97.0	88.0	.....
821	Japanese Millet E. C. Foss Co., Rochester, N. H., June 20, 1916. Lamb's Quarters, 270; Yellow Foxtail, 1,170.	A	96.5	93.5	.....
822	Timothy (*Gold Medal*) E. C. Foss Co., Rochester, N. H., June 20, 1916. Red Top, 225; Rib-grass, 225; Juncus sp., 1,800.	S	99.7	92.5	.....
823	Red Clover (*Eureka*) E. C. Foss Co., Rochester, N. H., June 20, 1916. Alsike Clover, 450; Rib-grass, 2,070; Timothy, 1,530; Wild Carrot, 1,260; Cheat, 360; unknown, 270.	S	98.0	54.0	.....
824	Oats S. A. Schurman & Son, Portsmouth, N. H., June 15, 1916.	A	98.0	S	90.0
825	Timothy (*Pan American*) S. A. Schurman & Son, Portsmouth, N. H., June 15, 1916. Alsike Clover, 1,125.	S	99.5	S	90.0
826	Timothy (*Imperator*) S. A. Schurman & Son, Portsmouth, N. H., June 15, 1916. Alsike Clover, 4,050; Kentucky Blue Grass, 675; Pepper-grass, 450; unknown, 225.	S	98.5	S	88.0
827	Red Clover (*Imperator*) S. A. Schurman & Son, Portsmouth, N. H., June 20, 1916. Docks, 360; Bromus sp., 1,170; Red Top, 90; Rib-grass, 2,160; Timothy, 450; Wild Carrot, 1,080; Yellow Trefoil, 90.	S	97.0	B	90.0
828	Corn (*Leaming, B Grade*) Hilliard & Kimball, Exeter, N. H., June 15, 1916.	99.7	.....	95.5	.....
829	Corn (*Leaming, A Grade*) Hilliard & Kimball, Exeter, N. H., June 15, 1916.	99.0	.....	90.0	.....
830	Corn (*Eureka*) Hilliard & Kimball, Exeter, N. H., June 15, 1916.	100.0	.....	92.5	.....
831	Red Clover (*Shield*) C. A. Daniels, Hudson, N. H., June 15, 1916. Alsike Clover, 360; Lamb's Quarters, 180; Rib-grass, 90; Yellow Trefoil, 90.	99.3	.....	94.0	.....
832	Timothy (*Shield*) C. A. Daniels, Hudson, N. H., June 15, 1916. Alsike Clover, 675; Kentucky Blue Grass, 900; Primrose, 3,600; White Clover, 675.	98.4	.....	74.0	.....
833	Japanese Millet (*S1,632*) Hill Hardware & Paint Co., Nashua, N. H., June 22, 1916. Barnyard Grass, 270; Ragweed, 360; Yellow Foxtail, 810.	99.0	.....	82.0	.....

S—Satisfactory.
A—Above.
B—Below.

SEED EXAMINATION, 1916.—*Continued.*

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
834	RED CLOVER (*Queen*) Hill Hardware & Paint Co., Nashua, N. H., June 22, 1916. Lamb's Quarters, 90; Mayweed, 180; Cheat, 180; Rib-grass, 2,700; Timothy, 90; White Clover, 180; Wild Carrot, 810; unknown, 90.	98.4	....	89.0	....
835	TIMOTHY (*Jersey*) Hill Hardware & Paint Co., Nashua, N. H., June 22, 1916. Crab-grass, 450; Lamb's Quarters, 225; Red Top, 2,250; Rugel's Plantain, 225; White Clover, 1,125; unknown, 450.	S	99.0	S	92.0
836	RED TOP (*Ace*) Hill Hardware & Paint Co., Nashua, N. H., July 29, 1916. Kentucky Blue Grass, 2,250; Old Witchgrass, 1,800; Juncus sp., 19,800; Yarrow, 41,400.	A	90.0	S	86.0
837	LAWN GRASS J. P. Pitman & Co., Laconia, N. H., July 29, 1916. Juncus sp., 2,600; Sorrel, 9,900; Yarrow, 18,000.	85.0	....	27.0	....
838	TIMOTHY (*Jersey*) J. P. Pitman & Co., Laconia, N. H., June 22, 1916. Bracted Plantain, 225; Velvet Grass, 225; Kentucky Blue Grass, 225; Red Clover, 225; Red Top, 900; Rugel's Plantain, 450; White Clover, 225; unknown, 675.	S	99.0	S	92.0
839	TIMOTHY (*Bison*) J. Jones & Son, Alton, N. H., June 15, 1916. Alsike Clover, 9,675; Cinquefoil, 225; Kentucky Blue Grass, 675; Red Top, 900; Rugel's Plantain, 900; Sorrel, 675; Vervain, 675; White Clover, 900; unknown, 1,200.	S	98.0	B	94.0
840	RED TOP (*White Mountain*) H. C. Sanborn, Laconia, N. H., July 29, 1916. Sheep Fescue, 450; Rugel's Plantain, 450; Yarrow, 19,800; Juncus sp., 10,800; unknown, 4,950.	A	95.0	S	90.0
841	TIMOTHY (*White Mountain*) H. C. Sanborn, Laconia, N. H., June 22, 1916. Kentucky Blue Grass, 1,350; Rugel's Plantain, 225; White Clover, 225; Yellow Foxtail, 225; unknown, 450.	S	99.7	B	97.0
842	MAMMOTH CLOVER (*White Mountain*) H. C. Sanborn, Laconia, N. H., June 22, 1916. Timothy, 90.	A	99.5	S	95.0
843	ALFALFA (*White Mountain*) H. C. Sanborn, Laconia, N. H., June 22, 1916.	S	99.5	B	90.0
844	HUNGARIAN (*Choice*) Thompson & Hoague, Concord, N. H., June 22, 1916. Green Foxtail, 360; Old Witchgrass, 450; Timothy, 450; Yellow Foxtail, 450; Japanese Millet, 90; unknown, 540.	S	99.0	B	92.0
845	TIMOTHY (*Choice*) Thompson & Hoague, Concord, N. H., June 22, 1916. Alsike Clover, 2,925; Kentucky Blue Grass, 450; Red Top, 225; Rugel's Plantain, 675.	A	98.0	S	95.0
846	RED TOP (*Prime*) Thompson & Hoague, Concord, N. H., July 29, 1916. Cinquefoil, 172,800; Black-eyed Susan, 5,400; Rugel's Plantain, 3,600; Shepherd's Purse, 900; Timothy, 472,500; Vervain, 4,500; Yarrow, 31,000; Juncus sp., 8,100; unknown, 4,500.	B	75.0	S	85.0
847	ALFALFA (*Best*) Thompson & Hoague, Concord, N. H., June 22, 1916. Alsike Clover, 630; Green Foxtail, 270; Kentucky Blue Grass, 900; Pigweed, 90; Red Clover, 630; Timothy, 2,050; Yellow Foxtail, 90; Sweet Clover, 1,080; unknown, 270.	B	99.0	S	90.0

S—Satisfactory.

SEED EXAMINATION, 1916.—*Continued.*

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
848	Timothy (*Pan American*) E. C. Foss Co., Rochester, N. H., June 15. 1916. Alsike Clover, 1,350; Kentucky Blue Grass, 225; Red Clover, 225.	S	99.5	S	92.0
849	Corn (*Sanford White*) Batchelder Bros., Tilton, N. H., June 15, 1916.	100.0	.....	90.5	.....
850	Corn (*Early Mastodon*) Batchelder Bros., Tilton, N. H., June 15, 1916.	100.0	.....	95.0	.....
851	Timothy (*Imperator*) C. S. Collins, Bristol, N. H., June 15, 1916. Alsike Clover, 3,600; Cinquefoil, 225; Kentucky Blue Grass, 450; Lamb's Quarters, 450; Pepper-grass, 450; Red Clover, 225; Rugel's Plantain, 1,125; unknown, 675.	A	98.0	B	90.0
852	Barley C. S. Collins, Bristol, N. H., June 15, 1916. Buckwheat, 117; Yellow Foxtail, 9; Oats, 486; Wheat, 9.	B	98.0	A	90.0
853	Wheat (*F. W. 88,188*) Manchester Hardware Company, Manchester, N. H., June 15, 1916. Barley, 45; Wild Buckwheat, 15; Oats, 15.	A	99.0	S	98.0
854	Corn (*Sanford White*) Manchester Hardware Company, Manchester, N. H., June 15, 1916.	100.0	.....	88.5	.....
855	Oats (*Northern Wonder*) Manchester Hardware Company, Manchester, N. H., June 15, 1916. Barley, 90; Wheat, 90.	A	96.2	S	93.0
856	Hungarian (*H, 80.220*) Manchester Hardware Company, Manchester, N. H., June 15, 1916. Green Foxtail, 90; Lady's Thumb, 1,530; Old Witchgrass, 90; Smartweeds, 540.	A	98.0	S	80.0
857	Rye (*S. R., 86.167*) Manchester Hardware Company, Manchester, N. H., June 15, 1916. Barley, 135; Oats, 45; Wheat, 30.	98.6	.....	96.5	.....
858	Timothy (*Durham*) John B. Varick Co., Manchester, N. H., June 22, 1916. Kentucky Blue Grass, 450.	S	99.5	S	99.0
859	Red Top (*Ace*) John B. Varick Co., Manchester, N. H., July 29, 1916. Juncus sp., 6,750; Yarrow, 38,250; unknown, 4,500.	A	90.0	S	86.0
860	White Clover John B. Varick Co., Manchester, N. H., June 23, 1916. Alsike Clover, 11,700; Chickweed, 1,125; Docks, 2,475; Field Dodder, 900; Sorrel, 1,350; Yellow Trefoil, 225; unknown, 1,125.	S	97.8	90.0	.....
861	Red Clover (*Ace*) John B. Varick Co., Manchester, N. H., June 23, 1916. Alsike Clover, 1,080; Bracted Plantain, 360; Catch-fly, 450; Docks, 2,700; Lady's Thumb, 270; Lamb's Quarters, 270; Cheat, 90; Rib-grass, 450; Sorrel, 90; Timothy, 1,260; Wild Carrot, 90; Yellow Foxtail, 180; Bur Clover, 90; unknown, 360.	S	98.0	S	90.0
864	Mammoth Clover (*XXX*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Alsike Clover, 900; Docks, 990; Lady's Thumb, 180; Lamb's Quarters, 180; Euphorbia sp., 450; Rib-grass, 90; Selfheal, 1,890; Sorrel, 3,240; Timothy, 90.	A	96.5	S	90.0
865	Alsike (*XXX*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Docks, 6,750; Lamb's Quarters, 900; Red Clover, 4,725; Red Top, 225; Rib-grass, 225; Sorrel, 8,325; Timothy, 12,825; White Clover, 30,825; Yellow Trefoil, 900; unknown, 900.	S	90.0	S	88.0

S—Satisfactory.
A—Above.
B—Below.

SEED EXAMINATION, 1916.—*Continued.*

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
866	HUNGARIAN (*X*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Barnyard Grass, 180; Green Foxtail, 540; Lady's Thumb, 4,500; Pigweed, 1,350; Ragweed, 1,440; Yellow Foxtail, 2,250; unknown, 2,250.	S	95.0	B	80.0
867	ALSIKE (*XX*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Catch-fly, 1,350; Chickweed, 225; Docks, 3,150; Mayweed, 1,350; Old Witchgrass, 4,275; Bull Thistle, 225; Cheat, 225; Pigweed, 900; Red Clover, 7,650; Rib-grass, 4,950; Rugel's Plantain, 675; Smartweeds, 225; Sorrel, 1,800; Timothy, 63,900; White Clover, 9,450; Yellow Foxtail, 450; Lotus sp., 1,800; unknown, 2,250.	S	80.0	S	82.0
868	RED TOP (*XX*) Holbrook Grocery Company, Keene, N. H., July 29, 1916. Cinquefoil, 97,200; Rugel's Plantain, 6,750; Timothy, 364,000; Yarrow, 39,600; unknown, 11,700.	S	75.0	S	83.0
869	TIMOTHY (*White Mountain*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Alsike Clover, 225; Kentucky Blue Grass, 675; Red Top, 900; White Clover, 225.	S	99.7	B	97.0
870	RED TOP (*XXX*) Holbrook Grocery Company, Keene, N. H., July 29, 1916. Cinquefoil, 85,500; Old Witchgrass, 900; Juncus sp., 11,250; Rugel's Plantain, 9,000; Shepherd's Purse, 900; Timothy, 113,400; Yarrow, 18,000; unknown, 27,000.	S	86.0	S	86.0
871	HUNGARIAN (*Monadnock*) Holbrook Grocery Company, Keene, N. H., June 23, 1916. Barnyard Grass, 270; Pigweed, 90; Ragweed, 90; Red Top, 90; Smartweeds, 180; Timothy, 270; Yellow Foxtail, 540; unknown, 90.	A	98.0	S	85.0
872	RED TOP (*Mastiff*) Abbott Grocery Company, Keene, N. H., July 29, 1916. Cinquefoil, 2,700; Juncus sp., 14,400; Timothy, 13,500; Vervain, 2,700; Yarrow, 56,250; unknown, 4,500.	A	90.0	S	91.0
873	TIMOTHY (*Mastiff*) Abbott Grocery Company, Keene, N. H., June 23, 1916. Cinquefoil, 225; Kentucky Blue Grass, 225; Pepper-grass, 225; Red Top, 225; unknown, 675.	S	99.5	B	98.0
874	TIMOTHY (*Old Home*) Abbott Grocery Company, Keene, N. H., June 23, 1916. Alsike Clover, 5,850; Cinquefoil, 225; Rugel's Plantain, 1,125; White Clover, 450; Yarrow, 225; unknown, 1,000.	A	97.7	B	95.0
875	RED CLOVER (*Old Home*) Abbott Grocery Company, Keene, N. H., June 23, 1916. Bracted Plantain, 90; Catch-fly, 90; Docks, 90; Pigweed, 180; Rib-grass, 450; Sorrel, 180; Wild Carrot, 180; Yellow Foxtail, 450; Yellow Trefoil, 90; Wild Caraway, 90; Fall Dandelion, 90; unknown, 900.	A	96.0	S	90.0
876	HUNGARIAN (*Old Home*) Abbott Grocery Company, Keene, N. H., June 23, 1916. Lady's Thumb, 630; Ragweed, 90; Pigweed, 180; Smartweeds, 630; unknown, 180.	A	98.0	S	80.0
878	MILLET (*Hungarian*) E. E. Hodgdon Est., North Conway, N. H., June 23, 1916. Green Foxtail, 810; Lady's Thumb, 270; Lamb's Quarters, 90; Old Witchgrass, 360; Timothy, 540; Yellow Foxtail, 270; Ragweed, 90.	A	96.0	36.0	....

S—Satisfactory.
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SEED EXAMINATION, 1916.—*Continued.*

Number.	Kind of Seed, Sender, Date of Report, and Kind and Number of Foreign Seeds Found in One Pound.	Purity.		Germination.	
		Found.	Guaranteed.	Found.	Guaranteed.
879	Timothy (*67,340*) .... E. E. Hodgdon Est., North Conway, N. H., June 23, 1916. Alsike Clover, 1,350; Cinquefoil, 225; Green Foxtail, 225; Pigweed, 225; Vervain, 1,575; unknown, 675.	S	99.0	93.0	.....
880	Timothy (*XX*) .... J. C. Richardson, Littleton, N. H., June 20, 1916. Alsike Clover, 1,125; Cinquefoil, 3,150; Blue Grass, 7,200; Black-eyed Susan, 450; Peppergrass, 450; Red Top, 4,050; Rugel's Plantain, 900; Speedwell, 450; unknown, 1,350.	S	97.0	S	89.0
881	Timothy (*Gold Medal*) .... Rand, Ball & King Company, Claremont, N. H., June 20, 1916. Alsike Clover, 675; Docks, 225; Kentucky Blue Grass, 450.	S	99.7	S	90.0
882	Timothy (*Pine Tree*) .... F. B. Spaulding Company, Lancaster, N. H., June 20, 1916. Alsike Clover, 225; Black Mustard, 225; Bracted Plantain, 225; Cinquefoil, 450; Pigweed, 225; Red Top, 900; Sorrel, 450; Black-eyed Susan, 225.	S	99.5	B	95.0
883	Red Clover (*Atlas*) .... F. B. Spaulding Company, Lancaster, N. H., June 20, 1916. Alsike Clover, 2,520; Black Mustard, 180; Docks, 180; Green Foxtail, 1,170; Lady's Thumb, 510; Heal-all, 90; Pig-weed, 90; Rib grass, 900; Rugel's Plantain, 90; Timothy, 90; Yellow Foxtail, 90; unknown, 450.	S	97.0	S	91.0
884	Timothy (*Durham*) .... Preston Bros., Henniker, N. H., June 20, 1916. Red Top, 900; unknown, 225.	S	99.5	B	99.0
885	Corn (*Sanford*) .... Preston Bros., Henniker, N. H., June 20, 1916.	A	99.0	S	97.0

S—Satisfactory.
A—Above.
B—Below.

SUMMARY TABLE SHOWING THE KINDS OF FOREIGN SEEDS FOUND IN SAMPLES EXAMINED IN 1916 AND THE NUMBER OF SAMPLES IN WHICH THEY WERE FOUND.

NAMES OF FOREIGN SEED.	Names of Samples Examined.										
	Alfalfa.	Alsike Clover.	Barley.	Mammoth Clover.	Millet.	Oats.	Red Clover.	Red Top.	Timothy.	White Clover.	Miscellaneous.
Number of samples examined	2	4	2	3	11	4	8	10	25	2	6
Alsike Clover	1	...	...	2	...	...	4	...	15	2	..
Barnyard Grass	...	...	...	...	5	...	...	...	...	...	..
Barley	...	...	...	...	...	3	...	...	...	...	2
Black Bindweed	...	...	...	...	...	1	...	...	...	...	1
Black-eyed Susan	...	...	...	...	...	...	...	1	1	...	..
Bracted Plantain	...	...	...	...	...	...	2	...	2	1	..
Buckwheat	...	...	1	...	...	...	...	...	...	...	..
Bull Thistle	...	2	...	...	...	...	...	...	...	1	..
Burr Clover	...	...	...	...	...	...	3	...	...	...	..
Canada Thistle	...	...	...	1	...	...	1	...	...	...	..
Catch-fly	...	2	...	...	...	...	2	...	...	1	..
Catnip	...	...	...	...	...	...	...	...	...	1	..
Cheat	...	1	...	1	...	...	5	...	...	...	..
Chickweed	...	1	...	...	...	...	...	1	...	1	..
Cinquefoil	...	...	...	...	...	...	...	5	8	...	..
Cockle	...	...	...	...	...	1	...	...	...	...	..
Crab-grass	...	...	...	...	...	...	...	...	2	...	..
Dandelion	...	...	...	...	...	...	1	...	...	...	..
Docks	...	3	...	2	...	...	4	...	1	3	..
Dodder	...	...	...	...	...	...	...	...	...	1	..
Green Foxtail	1	...	...	...	5	...	1	...	1	...	..
Juncus sp.	...	1	...	...	...	...	...	8	2	...	1
Kentucky Blue Grass	1	...	...	...	...	...	...	1	16	...	..
Lady's Thumb	...	...	...	1	5	...	1	...	...	...	..
Lamb's Quarters	...	1	...	2	2	...	3	...	2	1	..
Mayweed	...	2	...	...	...	...	2	...	...	...	..
Mustards	...	...	...	1	...	1	1	...	1	...	..
Oats	...	...	2	...	...	...	...	...	...	...	2
Old Witchgrass	...	1	...	...	4	...	...	2	...	1	..
Pepper-grass	...	...	...	...	...	...	...	...	9	1	1
Pigweed	1	1	...	...	3	...	2	...	2	...	..
Ragweed	...	...	...	...	5	...	...	...	...	...	..
Red Clover	1	4	...	...	...	...	...	...	5	1	..
Red Top	...	1	...	...	1	...	1	...	14	...	1
Rib-grass	...	2	...	2	...	...	8	...	...	1	..
Rugel's Plantain	...	1	...	...	...	...	1	1	10	1	..
Smartweeds	...	1	1	1	4	...	...	...	...	...	1
Sorrel	...	4	...	2	...	...	2	...	3	1	1
Sweet Clover	1	...	...	...	...	...	...	...	...	...	..
Timothy	1	4	...	3	3	...	5	4	...	1	..
Miscellaneous or unknown	1	2	...	1	5	1	5	9	13	2	1
Vervain	...	...	...	...	...	...	...	1	3	...	..
Vetch	...	...	...	...	...	1	...	...	...	...	..
Wheat	...	...	2	...	...	3	...	...	1	...	1
White Clover	...	4	...	...	...	...	1	...	8	...	..
Wild Sunflower	...	...	...	...	1	...	...	...	...	...	..
Wild Carrot	...	...	...	...	...	...	5	...	...	...	..
Yarrow	...	...	...	...	...	...	...	10	1	...	1
Yellow Clover	...	1	...	...	...	...	...	...	...	1	..
Yellow Foxtail	1	1	2	1	8	...	3	...	2	...	..
Yellow Trefoil	...	1	...	...	...	...	3	...	...	2	..

TABLE SHOWING RESULTS OF TESTS AND EXAMINATION OF SAMPLES OF SEEDS SUBMITTED BY THE COMMISSIONER OF AGRICULTURE FROM SEPTEMBER 1, 1915, TO SEPTEMBER 1, 1916.

Kind of Seed.	Total number.	Purity Test.										Germination Test.			
		Pure Seed.				Foreign Seed.			Inert Matter.						
		Highest per cent.	Lowest per cent.	Average. per cent.	Standard per cent.	Highest per cent.	Lowest per cent.	Average. per cent.	Highest per cent.	Lowest per cent.	Average. per cent.	Highest per cent.	Lowest per cent.	Average. per cent.	Standard per cent.
Alfalfa	2	97.6	98.7	98.7	98.0	1.2	.0	.6	1.2	.1	.6	90.5	82.0	86.0	85-90
Alsike Clover	4	98.4	82.6	91.8	95.0	15.3	.9	7.0	2.1	.2	.9	93.5	86.5	88.8	75-80
Barley	2	97.5	96.0	96.7	99.0	3.4	2.0	2.7	.6	.5	.5	98.0	95.5	96.7	90-95
Corn (*Field*)	7	100.0	99.0	99.8	99.0	.0	.0	.0	1.0	.3	.2	95.0	88.5	95.3	85-90
Mammoth Clover	3	100.0	97.6	98.6	98.0	1.6	1.0	1.0	.8	.0	.4	97.0	94.5	92.2	90-95
Millet	11	99.1	94.9	98.4	99.0	4.6	.5	1.2	.8	.0	.4	91.0	36.0	77.9	85-90
Oats	4	99.7	98.4	99.0	99.0	1.4	.0	.5	1.5	.1	.5	95.5	91.0	93.1	90-95
Red Clover	8	99.3	97.4	98.2	98.0	1.6	.2	1.2	1.0	.3	.6	96.5	54.0	81.4	85-90
Red Top	10	97.0	68.0	88.6	95.0	20.4	.6	4.6	11.7	2.4	6.8	88.0	83.0	85.5	75-80
Timothy	25	99.7	97.3	99.2	98.0	1.2	.0	.3	2.0	.0	.5	94.5	74.0	89.0	85-90
White Clover	2	97.1	66.3	81.7	95.0	30.0	2.4	16.2	3.7	.5	2.1	90.0	84.0	87.0	75-80
Miscellaneous	6	....	...	...	...	...	...	...	...	...	...	...	...	...	....
Total	84														

SUMMARY.

From the tables on the preceding pages it will be noted that 69 of the 84 samples collected were guaranteed for purity and 56 for germination. In other words, 82% of the seed represented by the samples was sold according to the law as regards purity and 66.6% as regards germination. These percentages are lower than last year when they stood at 85 and 82 respectively.

Of the total 69 samples which were guaranteed for purity, 65 of them, or 94%, were found to be up to or above the guarantee.

Of the 56 samples which were guaranteed for germination, 42 of them, or 75%, were found up to or above the guarantee.

Among the seeds tested this year, alfalfa, red clover, oats and timothy were on the average above the standard per cent. of purity; while alsike clover, millet and redtop were below the standard per cent.' As regards germination the average per cent. was up to standard for all kinds of seed except millet. The same was true last year and indicates that a considerable quantity of old millet seed is carried over from year to year.

One very dirty lot of redtop and one badly-mixed sample of white clover were found on the market this year. On the whole, however, the quality of seeds which are being offered to our farmers is improving, and the value of good seed is being appreciated more and more every year.

LABELING.

The law does not apply to the common five and ten-cent packages of garden and flower seeds. Only seeds sold in bulk or in packages of one pound or more are subject to the provisions of the law and are required to be accompanied by a guarantee stating their percentage of purity and vitality.

The guarantee or label may be of any form desired by the seller of the seeds, as a tag, sticker, or direct brand upon the container. It must, however, be plainly written or printed, and placed distinctly visible to the purchaser. Each dealer will provide his own labels.

TAKING OF SAMPLES.

To secure a fair average sample of a lot or bulk, take small quantities from all of the bags or from different parts of any particular bulk. Mix thoroughly and take out the sample to be inspected. When the seeds are in bags or large bins, the use of a grain sampler is most convenient, since this will insure getting seeds from the top, middle, and bottom alike. Since the report of the analysis is based upon the nature of the sample inspected, it is important that the sample be carefully taken.

SIZE AND AMOUNTS OF SAMPLES.

The size and amount of the samples necessary for a test will depend upon the size and weight of the seeds. About one half ounce or a tablespoonful of the smaller grass and vegetable seeds, like alsike and white clover, redtop, lettuce, onions, radish, turnip, etc.; about one ounce or two tablespoonfuls of the larger seeds, like timothy, millet, red clover, alfalfa, rape, etc.; and about four ounces or a small cupful of the cereal grains or vegetable seeds, like oats, barley, corn, peas, beans, etc., should be sent.

TESTS AND EXAMINATIONS.

Section 2 of the law states the provisions under which the tests and analyses shall be made. The Commissioner of Agriculture has appointed F. W. Taylor, Agronomist of the Experiment Station, as the regular agent for making all tests and analyses in this state. The sellers or dealers who desire to base their guarantees upon tests made by themselves or their agents must first secure the approval of the Commissioner of Agriculture of the methods to be used in making the tests, and of the person who is to conduct them.

Although the law makes no provision for the expenses of the seed tests, the Department of Agriculture has arranged with the Experiment Station to have the tests made **free of charge** to all dealers and farmers resident in the state.

SENDING OF SAMPLES.

Samples sent to the Experiment Station for testing should be enclosed in a strong paper envelope and securely fastened. They should not be sent in bottles or glass jars owing to the danger of breakage. When a number of samples are to be sent they should be put up securely in a single package and forwarded either by parcel post or by express. Each sample sent in should be marked as follows:

Name and address of sender.
Date of sending. Kind of seed.
Brand name (if any), and number of package.
Purity or germination test desired (one or both).

Write a letter stating the number and kind of samples sent so that their receipt may be promptly acknowledged.

Address all samples and communications regarding the same to F. W. Taylor, Experiment Station, Durham, N. H.

REPORT OF MEETING OF SEED ANALYSTS OF NORTH AMERICA.

In accordance with instructions from the New Hampshire Commissioner of Agriculture the writer attended the annual convention of the Seed Analysts of North America held at Minneapolis, July 13-15, 1916.

The meeting was attended by about thirty men and women representing fifteen states, the U. S. Department of Agriculture and the Canadian Department of Agriculture.

After the preliminary business the first order was the report of the Referee on Germination. Following the annual custom this referee selects seeds for tests and submits composite samples to the various laboratories throughout the country, with the idea that by an examination of the results obtained each laboratory may be made more efficient and that in the end the best methods of sampling and testing may be adopted as standard.

The report of the Germination Referee showed a considerable variation in the tests of different laboratories. Most of the variations, however, were within the limits of error allowed. The results obtained in our own laboratory were eminently satisfactory, except in the case of Kentucky bluegrass, redtop and certain garden seeds, which seem to require the services of a sunlight germinator which we have not yet installed.

The Referee on Purity conducted a series of tests similar to those on germination. He also found considerable variation of results among the different laboratories. The tests made in the New Hampshire laboratory, however, proved to be within the limits of error in every case. The referee emphasized the importance of the following points in his report:

(1) The difficulty of identifying and separating some of the impurities found in certain samples.

(2) Accurate weighing on delicate balances.

(3) Securing a representative portion of the seed for a test.

The Referee on Sampling reported that he had found much variation in the purity of seeds coming from two different bags of the same lot; also variation between seed from the top and seed from the bottom of the same bag. The data which he presented, while not conclusive, emphasized the importance of securing a sample for test from several different places in a bag or lot of seed.

The report of the Committee on a Uniform Seed Law was submitted, but owing to lack of time and the tardy arrival of the suggestions from the seedsmen's convention this report was tabled until the next meeting. The need of a uniform seed law in all states seemed to be felt by both analysts and seedsmen, and it is hoped that our state may be represented at the next meeting of the association when the draft of this bill will come up finally.

Mr. Edgar Brown, of our Federal Seed-Testing Laboratory at Washington, D. C., pointed out some defects in the National Seed Importation act in a paper entitled "Further Importations of Low-grade Seed Not Subject to the Seed Importation Act." This act carries no safeguard against seed which will not germinate. Consequently, there is annually imported into this country large quantities of seed of low viability. This is particularly true, he said, of seed of orchard grass, rye grass and crimson clover. Much of the imported rape seed is not true to name. This also escapes our present defective importation law.

In a paper on "Seed Legislation," Dr. E. M. Freeman, of Minnesota, emphasized the need, not only of a uniform state seed law, but also of a federal seed law, which could be enforced by the Interstate Commerce Commission. At the present time we have no federal law, consequently many "out of state" firms sell seed across the line in another state in direct violation of the seed law of that state. At present the offended state has no recourse.

Mr. George E. Green, of the Illinois Seed Company of Chicago, presented a paper on "Seed Legislation as the Seedsman Sees It." Although in favor of seed legislation in general, he says, the seedsman is opposed to any requirements for a seed germination test for two reasons: (1) because of the time involved in making the test; (2) because of the rapidity of the deterioration of seed. Both these reasons, he said, made any germination requirements in a seed law unfair to the seedsman.

Mr. Jno. R. Dymond, from the office of the Canadian Seed Commissioner at Ottawa, in a discussion of "Paper Packet Seeds" showed that from their results obtained in testing a large number of samples in packets that much of the seed on the market in this condition is poor. That some seedsmen are or seem to be honest in putting a good grade of seeds in their packets, while others have no hesitancy in putting poor seeds in theirs. In this regard the farmer must determine for himself a reliable dealer and buy from him, as most of our seed laws have nothing to say with regard to the requirements of packet seeds.

The members of the convention had the opportunity of visiting the Pillsbury "A" Flour Mill on July 13th. This is the largest mill in the world, having a capacity of 18,000 barrels per day. We were here able to see the process of flour-making from beginning to end. We also visited the seed firm of Northrup, King & Co., and inspected it from office to storage.

On July 15th we were taken through the seed laboratory at the University of Minnesota, saw their equipment and methods, and also the collection of seed laboratory material which they had collected for the meeting. We were also shown over the farm and field plots of the experiment station.

Friday evening an informal dinner was held at the Hotel Radisson for the members of the convention and seedsmen. After the dinner various representatives were called upon for talks. Inasmuch as it was the first time New Hampshire had ever been represented at such a meeting, your representative responded by telling of the New Hampshire seed law, its administration, and how it is working out.

Very respectfully submitted,

FORD S. PRINCE,
Assistant Agronomist.

OTHER INFORMATION.

Other publications on the subject of seed testing are as follows:

Circulars Nos. 34 and 35, U. S. Department of Agriculture, Washington, D. C.

Bulletin No. S-I, Canadian Department of Agriculture, Ottawa, Can.

Bulletin No. 146, Vermont Experiment Station, Burlington, Vt.

Circular No. 4, Wisconsin Experiment Station, Madison, Wis.

Bulletin No. 115, Iowa Experiment Station, Ames, Iowa.

Bulletin No. 110, Nebraska Experiment Station, Lincoln, Neb.

Seed Bulletin No. 1, North Dakota Experiment Station, Fargo, N. D.

Bulletin No. 83, Bureau of Plant Industry, Washington, D. C.

Bulletin No. 270, Michigan Experiment Station, East Lansing, Mich.

Bulletin No. 394, New York Experiment Station, Geneva, N. Y.

Bulletin No. 198, Kentucky Experiment Station, Lexington, Ky.

Bulletin No. 111, Bureau of Plant Industry, Washington, D. C.

Farmers' Bulletin No. 260, Division of Publications, Washington, D. C.

Bulletin No. 189, Maryland Experiment Station, College Park, Md.

Bulletin No. 159, Minnesota Experiment Station, St. Paul, Minn.

Bulletin No. 312, Cornell University, Ithaca, N. Y.

Extension Bulletin Nos. 24 and 39, University of Minnesota, St. Paul, Minn.

Official Inspection No. 46, Maine Experiment Station, Orono, Me.

Bulletin No. 279, New Jersey Experiment Station, New Brunswick, N. J.

Twenty-fourth Annual Report, Massachusetts Experiment Station, Jan., 1912, Amherst, Mass.

Twenty-fifth Annual Report, North Dakota Experiment Station. Feb., 1915, Fargo, N. D.

Bulletin, Oct., 1912, North Carolina Department of Agriculture, Raleigh, N. C.